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ABSTRACT

Methods by which preservice physical education teachers use selected behaviors to promote handicapped student physical performance in planned skill activities are explored. The basic assumption investigated is that teacher behaviors when working with any child in physical education will have basic similarities. Discussion focuses on processes used in the study, including exploration and identification of effective teacher behaviors, development of a method for observing and recording the behaviors, and determining means to rate and evaluate the results. (MJB)

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Measuring Effective Teacher Behavior in Adapted Physical Education

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Measuring Effective Teacher Behavior in Adapted Physical Education

Since 1952, adapted physical education has been uniformly defined as:

> a diversified program of developmental activities, games, sports, and rhythms, suited to the interests, capacities, and limitations of students with disabilities who may not safely or successfully engage in unrestricted participation in the vigorous activities of the general physical education program (American Association for Health, Physical Education, and Recreation, 1952).

According to this definition, adaptation of games, equipment, and play environments is an integral part of the learning process in adapted physical education. However, today it is necessary to understand the teaching and learning processes, teaching strategies, and student individual learning styles. More importantly, there exists a need to emphasize more effective teaching behaviors which can be measured with the aid of observation instruments when instructing special populations in physical education.

The recent physical education literature and research has an absence of studies on teacher behaviors and the use of observation instruments to record the teaching and learning processes in adapted physical education settings (Cheffers, Amidon & Rogers, 1974; Cheffers, 1977; Cooper, 1977; Dunkin & Siedentop, 1976). The related literature in special education has addressed some teacher behavior questions (Shores, Burney & Wiegerink, 1976). Likewise, the modification of teacher behavior in special education has been a concern for some time (Blatt, 1964). Of the 140 observation instruments which have been developed and reviewed (Locke, 1977; Rosenshine, 1970; Simon & Boyer, 1970), none have been reported as being used in adapted physical education.

Observation instruments deal with collecting data for describing and analyzing the frequency of teacher and student interactions. In classroom observational studies, teacher verbal and non-verbal moves and interactions are units of analysis. Whereas the locus in physical education studies is the manner teachers promote student sustained physical performance with cognitive and affective activities in supportive roles.

Because the dominant trend in adapted physical education literature continues to be the manner in which professionals adhere to modifying programs and equipment (Loovis and Taylor, n.d.) and because of the lack of studies on teacher behavior in adapted physical education, and an absence of using observation instruments to measure teacher and student interactions, the authors have forwarded two investigative assumptions:

1. The teacher's behavior performances when working with all children in physical education have basic similarities.
2. The teacher's behavior performances when interacting with pupils who have special needs require tailoring and illuminating (Loovis and Taylor, n.d.).

Based upon these assumptions, the investigators have adopted supportive operational definitions of teacher behaviors and conditions suggested for the structure under which teaching occurs. N. L. Gage (1972) defines teaching "as events, such as teacher behavior, intended to affect the learning of a student" (p. 16). He refers to teacher behaviors as exertion of behavioral influences on learners and broadly describes behavioral influences as "stimuli that affect organisms via sensation and perception and influence behavior in some more or less lasting way" (p. 43).

Turner's (1971) analytic propositions about teaching are helpful in

supporting our assumptions. He states:

> First, all teaching is dyadic--i.e., involves reciprocal interdependent responding between at least two persons. That one of these persons holds the greater authority and has control of substantial reinforcements which can be delivered to or withheld from the other are common features of teaching. Second, there must be a gap between the performance of one of the persons, the pupil, and a performance standard held by the other person, the teacher. Third, the person holding the performance standard must engage in an hypothesized instrumentality to close the gap between the performance of the pupil and the performance standard. To assert that the teacher engages in an "hypothesized instrumentality" means that he selects a response or set of responses which he implicitly or explicitly predicts will close the gap. Sometimes this prediction is true and sometimes it is not. (p. 12)

Typically, when measuring teacher behaviors, the relationship between teacher's behavior and the learner's performances are studied. The investigators believe that a teacher behavior influence is either more or less effective (similar to hypothesized instrumentality) in any given situation, with any given student, under any given curriculum. Thus, in measuring teacher behaviors, it is necessary to identify when behaviors are considered more or less effective when influencing a learner's performance.

In this study, the investigators tested the accuracy of the first assumption by aligning the study's aims with those of the most recent observational research on teaching in order to focus on the processes rather than the effect of teaching. To conduct this study the Physical Education Observation Instrument (PEOI) was used to measure the occurrence of selected behaviors during the instructional process. The behaviors categorized on the PEOI were not known to the teachers. The purpose of this exploratory study was to discover if behaviors on the PEOI

occurred in special education environments with any degree of interactions, patterns and consistency.

Method

Setting

This study was conducted in a teaching laboratory which is a segment of an undergraduate adapted physical education course at the University of Illinois at Urbana-Champaign. The purposes of the laboratory are numerous. Two of the more important ones include development of realistic perceptions regarding special populations, their motoric capabilities, and an understanding of program planning, implementation, and evaluation based upon the special needs of individuals.

The teaching laboratory operates on Saturday mornings and consists of swimming and developmental motor activities suited to the needs of the clients. The children and young adults who range in age from four to twenty-one years are volunteers from the Champaign-Urbana community. The instructors are undergraduate physical education majors who are receiving their first real exposure to special populations in an instructional setting.

Sample

Fourteen females and one male comprised the total sample for the study. Data were collected on all fifteen subjects; however, one male and one female were eliminated from the analysis of the group data. The subjects were juniors and seniors who elected to be in the course. The subject's experiences in teaching range from coaches of little league sports teams to recreation leaders at summer camps.

Instrumentation

The Physical Education Observation Instrument (PEOI) (Taylor, 1976) was designed to record the frequency of behavior interactions and patterns between teacher and students during instructional events. The instrument includes 14 behavior variables: nine are teacher behaviors, four are student behaviors, and the final variable, "other," is a catch-all category for all behaviors observed but not mentioned on the instrument. Teacher behaviors selected for the PEOI were deduced from physical education and education literature and research. Student behaviors are modified from Jewett's (1971) "process-oriented classification of movement."

The PEOI is composed of six different operations. First, it is a dyadic instrument because teacher and student behaviors are categorized on the instrument and codings indicate the interaction of teacher and student behaviors. Second, it is classified as having "low-inference" behavior measures which focus on specific, denotable, relatively objective behaviors. Third, it has a sign-system recording-procedure which means that a behavior can only be coded only once within a specific time (10 seconds) period. Fourth, the instrument is scaled for coding behaviors in 10-second Intervals. Fifth, it has a multiple coding format which means that more than one behavior can be coded in a 10-second interval. Sixth, the instrument behaviors form a series of facets. Facets form mutually exclusive sets of teacher and student behaviors in order to provide information about when teacher instruction and student performances are and are not occurring.

In another study the PEOI was found to be a valid and reliable instrument with raters scores using generalizability study theory of $\hat{E}p^2$ .89 to .99 for 12 of the 14 variables on the instrument (Taylor, 1976).

Rater Training, Reliability Study

Rater Training. The investigators acted as raters in the study. Both raters were familiar with the adaptive physical education environment. The systematic training of raters occured in the following manner:

1. Raters learned the definitions of the PEOI behaviors.
2. Raters learned and practice operating the PEOI.
3. Raters received practice in operating the PEOI while watching videotapes of normal physical education class activities of movement education and rhythmes.
4. Raters received practice in operating the PEOI while watching videotapes of adaptive physical education class activities of movement education.

Rater reliability study. In order to establish rater reliability using the PEOI in adaptive physical education classes, videotapes of three females and one male pre-service physical education teachers were made. Each teacher instructed one handicapped student in developmental motor activities in a gymnasium. All teaching episodes were taped for three to seven minutes, and teachers were requested to instruct their student as they would under normal conditions.

For the inter-rater phase of the reliability study, the raters together observed and coded the four teaching episodes from a video-monitor. One week later, the intra-rater phase was conducted with each rater individually observing and coding the tapes.

Flander's Methods of Calculating π for Optional and Minimal Cases (Frick and Semmel, 1974) and Pearson Product-Moment Correlation was employed for inter and intra-rater analysis. Inter-rater scores ranged from .89 to .99 and intra-rater scores ranged from .96 to .99 for both raters (See Tables 1,2,3, for summary results with a t-test indicating γ significant $P < .01$). These

scores indicated that the raters were able to reliably operate the PEOI.

An inter-rater reliability spot check was performed toward the end of the study to see how much instrument operation decay had taken place. The spot check inter-rater reliability scores were .98 Flander π and a .95 correlation coefficient ($P < .01$).

Natural gym setting study. To test our assumption and to explore the possibilities of identifying more or less effective teaching behaviors, the pre-service teachers instructed handicapped students in developmental motor activities in a gym.

Each teacher was video-taped on two separate five minute instructional occasions. A panel of judges agreed that handicapped students learning a motor skill needed a three to seven minute instructional occasion, of course depending on the students handicap, the teacher's experience and the complexity of the activity.[1]

Our intention was to record how teacher and students naturally used the selective behaviors categorized on the PEOI in order to measure the frequency of behavior occurrences as well as the behavior's durations and combinations of behaviors.

Analysis and Results

The raters used the PEOI to decode the videotapes. One rater observed six teachers and their individual students, and the other rater observed seven

[1]The three judges were practicing professionals in the special education field who deliver physical education to pupils ages 3 to 21.

teachers and their individual students. Table 4 presents the cumulative results of 13 teachers' first and second instructional occasions. Mean (%) scores and raw scores are depicted for teacher and student frequency of behavior occurrences. The two instructional occasions did not vary much. "Teacher promoting drill and practice" and "student organizing movement" were dominant dyadic behaviors. Most importantly, the descriptive data indicated that overall, teachers promoted student performance of motor skills utilizing a combination of explanation, feedback and reinforcement as supportive behaviors more often than the other behaviors on the PEOI.

This cumulative group data does not help us in looking at more or less effective teaching. Therefore, the individual profiles in Figures 1 and 2 were developed to provide us with visual data about patterns of teacher and student behaviors which run horizontally in each category, and also gives us evidence of sustain student behaviors and the duration of teacher acts over time. The behaviors that run vertically in an interval provides behavior interactions which are usually multiple in occurrence and come in combinations. Figure 1 is an example of a more effecive teaching episode. Visible immediately are the large bands of sustained teacher and student behaviors, i.e., "promoting drill and practice" and "organizing movement" respectively. With the exception of intervals #16 to #20 inclusive (That is, 50 seconds of elasped time), the teacher was successful in promoting the learner's sustained physical performance with short, intermittant intervals of explanation and one demonstration in interval #13.

In contrast, a less effective teach is exhibited in Figure 2. In this profile the teacher and student dyad was restricted primarily to "explanation-

demonstration" and "developmental engagement", i.e., the teacher talked and the student listened. To make matters worse, the learner was involved in physical activity for only 40 seconds during a five minute teach.

The use of the profiling technique permits a visual analysis of patterns of behavior even if the patterns are not the most desirable as in Figure 2. It is necessary to emphasize that evaluation of the student's teaching includes more than an analysis of the profiles. Taken into consideration were the following: the functional abilities of the child, the social-emotional behavior of the child especially if those behaviors were chronic and disruptive to the teaching process, the quality of the student's weekly planning and the attempt to carry-out that plan, and the manner with which the student was able to adapt to the environment and/or equipment to facilitate instruction.

Discussion

This study concentrated on the processes of teaching--that is, how pre-service physical education teachers used selected behaviors to promote handicapped student physical performances in planned skill activities. The basic assumption explored in this study was that the teacher's behavior performances when working with any child in physical education have basic similarities. In essence, it is also assumed that the numerous systematic observation studies in normal school environments have provided educators with a plethora of information useful for measuring teacher behaviors (Dunkin & Biddle, 1974; Rosenshine, 1970; Gage, 1971; Locke, 1977), and therefore, similar observation studies would be useful in adaptive physical education settings. Although carrying out observational studies lack the clear, decisive flavour of an experiment, the

continuous data provide information about certain behaviors which occur more frequently than others relative to certain environmental changes.

Because the PEOI has been used in studies to code the frequency of selective teacher and student behaviors in natural school settings the investigators felt that the PEOI could do the same in the adapted physical education teaching laboratory which is representative of a natural pedagogical environment. The use of the PEOI aided the investigators in identifying and recording teacher and student behaviors in terms of frequency of occurrences, duration, patterns and interactions. The analysis of the data provided strong evidence about what went on between a teacher and a handicapped student and indicated that teacher behavior influences toward a student were more or less effective in terms of a students' sustained or lack of sustained performance over time.

The data obtained from the observational studies verified the accuracy of the investigative assumption. We, therefore, advance the propositions that more effective teacher behavior are delivered patterns of selective behavior influences interacting overtime with learner's sustained physical performance of motor skills in an activity planned by the teacher. And, that less effective teacher behaviors are: (1) a lack of delivered patterns of selective teacher behaviors (interacting) with students sustained performance of selective behaviors; (2) delivered patterns of selective teacher behaviors (interacting) with an absence of learner's sustained physical performance and (3) lack of delivered patterns of selective teacher behaviors and an absence of learner's sustained physical performance. More or less effective teacher behaviors measured in this study occurred over time in a movement activity planned by the teacher.

Analyzation of the cumulative or group data provides the teacher educator with little in the way of substantive information about more or less effective teaching. However, if one utilizes the profiling technique which is suggested in this study, then it is possible to analyze individual teacher behavior over time. It is then possible to determine the frequency with which more or less effective behaviors are being utilized and to ascertain the extent to which these behaviors are sustained during the course of instruction. It is our belief that information of this calibre is necessary if behavioral change is indicated.

Since the reliability of the PEOI was originally established in natural school settings using regular classes and since this was the initial application of the PEOI in an adapted physical education setting, this study was considered exploratory in nature. With its completion, this study acknowledges that similarities, as measured by the PEOI, do exist and that with only minor alterations the PEOI is a valid and reliable instrument for observing teacher and student behavior in adapted physical education.

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Table 1

Flander's π and Pearson Product Moment
Correlation Coefficients of Two Observers
Inter-rater tests

Reliability Tests	Flander's π	Pearson γ
1	.94	.90*
2	.97	.99*
3	.98	.99*
4	.89	.97*

* (P< .01)

Table 2

Flander's π and Pearson Product Moment Correlation Coefficients of Observer A four Intra-rater tests

Reliability Tests	Flander's π	Pearson γ
1	.97	.98*
2	.97	.99*
3	.96	.98*
4	.98	.98*

* (P< .01)

Table 3

Flander's π and Pearson Product Moment Correlation Coefficients of Observer B four Intra-rater tests

Reliability Tests	Flander's π	Pearson γ
1	.97	.99*
2	.99	.99*
3	.96	.98*
4	.98	.97*

* (P< .01)

Table 4

Means and Percentages of Teacher and Student Behavior Variables on the PEOI for Two Instructional Occasions

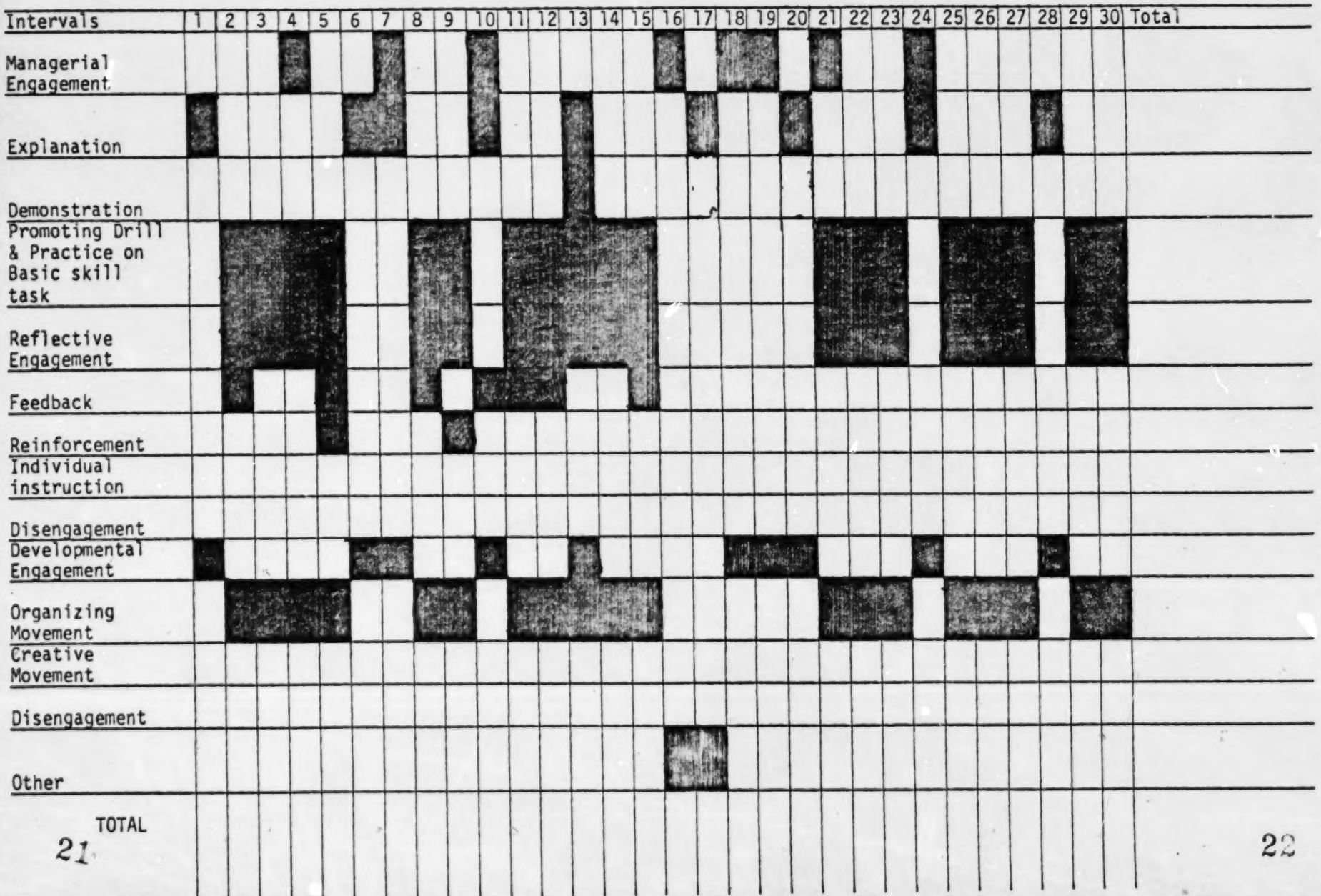
Variables	Instructional Occasions 1		2	
	$\overline{X}$	%	$\overline{X}$	%
	Teacher Behaviors			
1. Managerial Engagement	3.5	3.43	3.15	3.45
2. Explanation	13.76	14.28	12.07	13.21
3. Demonstration	4.3	4.54	2.92	3.19
4. Promoting Drill and Practice	16.76	17.39	16.92	18.51
5. Reflective Engagement	17.46	18.11	15.92	17.42
6. Feedback	3.00	3.11	4.1	4.54
7. Reinforcement	4.00	4.15	4.46	4.88
	Student Behaviors			
8. Developmental Engagement	12.00	12.45	10.69	11.70
9. Organizing Movement	16.92	17.55	16.69	18.26
10. Creative Movement	0.0	0.0	0.0	0.0
	Teacher and Student Behaviors			
11. Other	4.76	4.9	4.38	4.79

Figure Captions

Figure 1. More effective teaching episode

Figure 2. Less effective teaching episode

PHYSICAL EDUCATION OBSERVATION INSTRUMENT (PEOI)
RATER FORM



PHYSICAL EDUCATION OBSERVATION INSTRUMENT (PEOI)
RATER FORM